

Appln. No.: 10/715,809
Amendment Dated December 21, 2005
Reply to Office Action of September 2, 2005

KSI-325US

Amendments to the Claims: This listing of claims will replace all prior versions, and listings, of claims in the application

Listing of Claims:

1. (Currently Amended) A wire bonding machine for bonding a wire to a semiconductor device, the wire bonding machine comprising:

a wire bonding head supporting a bonding tool, the bonding tool adapted to attach a wire end to a semiconductor device, the bonding head having at least a portion which is pivotable about a first substantially horizontal axis, the bonding tool being supported by the pivotable portion so as to be vertically movable, the bonding head being rotatably mounted to a portion of the wire bonding machine so as to permit rotation of the bonding tool about a vertical axis, the bonding head being configured to provide motion of the bonding tool along only one of (a) a substantially horizontal x-axis direction and (b) a substantially horizontal y-axis direction;

a work table for supporting at least one semiconductor device to be wire bonded; and

a positioning system for positioning the work table in at least one direction relative to the bonding head during the a wire bonding operation.

2. (Previously Presented) A wire bonding machine according to claim 1 further comprising a second wire bonding head mounted above the positioning system.

3. (Currently Amended) A wire bonding machine for bonding a wire to a semiconductor device, the wire bonding machine comprising:

a wire bonding head supporting a bonding tool, the bonding tool adapted to attach a wire end to a semiconductor device, the bonding tool being rotatable alone or in combination with at least a portion of the bonding head about (1) a substantially horizontal axis and (2) a substantially vertical axis, the wire bonding head being configured to provide motion of the bonding tool along only one of (a) a substantially horizontal x-axis direction and (b) a substantially horizontal y-axis direction;

a work table for supporting at least one semiconductor device to be wire bonded; and

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a positioning system for positioning the work table in a substantially horizontal direction during the a wire bonding operation.

4. (Currently Amended) A wire bonding machine for bonding a wire to a semiconductor device, the wire bonding machine comprising:

a wire bonding head supporting a bonding tool, the bonding tool being rotatable alone or in combination with at least a portion of the bonding head about a substantially vertical axis and a substantially horizontal axis, the wire bonding head being configured to provide motion of the bonding tool along only one of (a) a substantially horizontal x-axis direction and (b) a substantially horizontal y-axis direction;

a work table for supporting at least one semiconductor device to be wire bonded; and

a positioning system for positioning the work table in a substantially horizontal direction during the a wire bonding operation.

5. (Cancelled)

6. (Previously Presented) A wire bonding machine according to claim 4 wherein the wire bonding head is rotatably supported by a portion of the wire bonding machine such that the bonding tool is rotatable about the substantially vertical axis.

7. (Previously Presented) A wire bonding machine according to claim 4 wherein the substantially horizontal direction is substantially orthogonal to the substantially horizontal axis.

8. (Original) A wire bonding machine according to claim 4 wherein the at least one semiconductor device is positioned in a magazine with at least one other semiconductor device.

9. (Original) A wire bonding machine according to claim 8 further comprising a magazine handler for feeding the magazine to the conveyance system.

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10. (Currently Amended) A wire bonding machine for bonding a wire to a semiconductor device, the wire bonding machine comprising:

a fixture supporting at least one semiconductor device to be wire bonded in a substantially horizontal plane;

a wire bonding head supporting a bonding tool, the wire bonding head being rotatably mounted to a portion of the wire bonding machine to permit rotation of the bonding tool about a substantially vertical axis, the bonding tool being rotatable about a substantially horizontal axis alone or in combination with the wire bonding head, the wire bonding head being configured to provide motion of the bonding tool along only one of (a) a substantially horizontal x-axis direction and (b) a substantially horizontal y-axis direction; and

a positioning system for positioning the fixture in a substantially horizontal direction.

11. (Cancelled)

12. (Previously Presented) The wire bonding machine according to claim 10 wherein the bonding head has a longitudinal axis and the positioning system translates the fixture in a direction at an acute angle with respect to the longitudinal axis of the bonding head.

13. (Previously Presented) The wire bonding machine according to claim 10 wherein the bonding tool is rotatable about the horizontal axis for movement of the bonding tool in a vertical direction.

14. (Original) The wire bonding machine according to claim 13 wherein at least a portion of the wire bonding head is rotatable about the horizontal axis and the bonding tool is secured to the portion of the wire bonding head to rotate about the horizontal axis.

15. (Previously Presented) The wire bonding machine according to claim 10 further comprising a motor drive assembly engaged with the wire bonding head on an opposite side of the vertical axis from the bonding tool.

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16. (Previously Presented) A wire bonding machine for bonding a wire to a semiconductor device, the wire bonding machine comprising:

a fixture supporting at least one semiconductor device to be wire bonded in a substantially horizontal plane;

a wire bonding head supporting a bonding tool, the wire bonding head being rotatably mounted to a portion of the wire bonding machine to permit rotation of the bonding tool about a vertical axis; and

a motor drive assembly engaged with the wire bonding head on an opposite side of the vertical axis from the bonding tool, the bonding head having a mass that is substantially balanced on opposite sides of the vertical axis.

17. (Previously Presented) The wire bonding machine according to claim 10 further comprising a second wire bonding head including a second bonding tool supported thereby, the second wire bonding head rotatably mounted to a portion of the wire bonding machine to permit rotation of the second bonding tool about a second vertical axis.

18. (Previously Presented) The wire bonding machine according to claim 10 further comprising a camera for receiving an image of at least one of the fixture or the at least one semiconductor device.

19. (Previously Presented) The wire bonding machine according to claim 18 wherein the camera is supported by the bonding head.

20. (Previously Presented) The wire bonding machine according to claim 18 wherein the camera is mounted to a camera conveyance system which carries the camera in a substantially horizontal direction.

21. (Previously Presented) The wire bonding machine according to claim 3 wherein the substantially horizontal direction is substantially orthogonal to the substantially horizontal axis about which the bonding tool rotates.